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ALBERTA ENERGY

1994 — 1995
ANNUAL REPORT

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The Honourable Stanley S. Schumacher
Speaker of the Legislative Assembly
Province of Alberta

Mr. Speaker:

I have the honour of submitting the Annual Report of the Alberta Department of Energy for the fiscal year ending March 31, 1995.

Respectfully submitted,

Patricia Black

Patricia L. Black
Minister of Energy

The Honourable Patricia Black
Minister of Energy

Dear Minister:

It is my pleasure to submit the Annual Report of the Alberta Department of Energy for the year 1994–95. The report contains a summary of the Department's activities, revenues and expenditures for the year.

Respectfully submitted,

Richard M. Hyndman
Deputy Minister of Energy

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MINISTER'S MESSAGE

Alberta's oil and gas industry enjoyed a remarkably active year in 1994, the busiest period it has experienced since the mid-1980s. Natural gas prices were relatively strong at the beginning of the year, so most of the activity in the succeeding months focused on drilling for gas, with rigs busier than they had been for more than a decade. Industry's overall optimism could be seen in the purchase of leases and licenses for petroleum and natural gas rights, which were among the highest ever recorded in the province.

The robust performance of the industry fuelled other parts of the Alberta economy, and our growth rate again set the pace for Canada. Clearly, Alberta's energy sector continues to serve as a catalyst for investment, development and economic growth. It is because of this important contribution that the government and Energy Ministry are so strongly committed to creating and maintaining a climate that encourages an active, vigorous oil and gas industry.

One significant way we are improving the operating climate is through regulatory reform. Part of the strategy outlined in the Ministry's three-year business plan (1994–95 to 1996–97) calls for clarifying and streamlining the regulatory framework and reducing the administrative burdens on industry. In 1994–95, we pushed ahead with the Energy component of what is a government-wide initiative aimed at cutting the red tape that so often hampers industry and delays the decision-making process.

We have carried out a full review of all regulatory matters under the Ministry's jurisdiction, covering more than 900 items — statutes, regulations, directives, information letters, guidelines and other instruments affecting the industry. This review was conducted in full consultation with industry, and later we asked stakeholders for their views on what we proposed to do.

In the coming fiscal year, we will implement our action plan, repealing those regulations where there is stakeholder consensus to do so and then focusing on items recommended for change or further review.

Although not part of the regulatory review, mention should be made here of two new moves in the deregulation of the natural gas industry that occurred in 1994–95. Under one change approved by Cabinet, the way was cleared for core market natural gas consumers in Alberta to purchase directly from producers and marketers. This move should benefit both consumers and the industry.

The Department also streamlined the administration of natural gas removal permits by repealing the Permit Conditions Regulation. Companies no longer have to file detailed downstream information with the Minister of Energy when seeking natural gas removal permits. This was a case where an administrative process was no longer required, so it was eliminated.

The year brought far-reaching changes to the Ministry's organizational framework, as we carried out the major restructuring announced at the end of the previous fiscal year. Another essential part of the business plan, the restructuring, is helping us streamline operations and improve efficiency so that we can maintain high-quality service to the public and industry while adhering to the government's budget-cutting guidelines.

The reorganization brought two former separate agencies — the Alberta Oil Sands Technology and Research Authority (AOSTRA) and Alberta Oil Sands Equity (AOSE) — into the Department, as well as the regulatory and policy responsibilities of the Alberta Petroleum Marketing Commission (APMC). We also regrouped a number of functions, eliminating old divisions and creating new, more integrated units.

The Alberta Geological Survey (AGS) became part of the Department on March 1, 1995 through a transfer of administration from the Alberta Research Council. The Department had been a co-funder of the AGS, along with the Research Council.

One of the most far-reaching changes was the amalgamation of the Energy Resources Conservation Board (ERCB) and the Public Utilities Board (PUB) to form a new quasi-judicial regulatory authority called the Alberta Energy and Utilities Board (AEUB).

With this new agency we are eliminating or reducing duplication, as well as providing industry with a one-window approach on many regulatory matters. On February 2, 1995, I announced the appointment of Céline Bélanger, a former member of the National Energy Board of Canada, as the first Chair of the AEUB.

The three-year business plan commits the Ministry to reducing its budget by 23 per cent by 1996–97. One measure taken in 1994–95 towards meeting this goal was to privatize our energy efficiency publications program and the toll-free information line. This move resulted in savings of about $1.1 million.

We made significant progress through the year on the long-debated restructuring of Alberta's electric industry.

In October, a multi-stakeholders' Steering Committee that I had established to look at the issues released its report, *Enhancing the Alberta Advantage: A Comprehensive Approach to the Electric Industry*. The report proposed a number of changes, including replacement of the Electric Energy Marketing Act (EEMA), provisions for increased competition in building new power generation, and incentive measures for utilities. These changes should ensure continued low rates for consumers.

In December, the government endorsed the recommendations and announced that it would introduce the appropriate legislation during the next session of the Legislature. We plan to have the legislation implemented by January 1, 1996.

A basic philosophy of the government is that the ownership of businesses should be left to the private sector. In keeping with this view, in August the government sold its ownership share in the Bi-Provincial Upgrader in Lloydminster, Saskatchewan. The sale removed any future risk that Alberta taxpayers' dollars would be used to keep the plant operational.

Environmental questions continued to be important items on the Department's agenda throughout the year.

We have been actively involved in the specific issue of greenhouse gases since 1990, when we established the Clean Air Strategy for Alberta. In 1994–95, the Deputy Minister of Energy served as the first president of the resulting management structure, the Clean Air Strategic Alliance (CASA).

CASA's recommended approach to climate change was adopted by the Alberta government and became the basis for our active participation in the process to develop a national action program. We strongly support a voluntary approach that allows individuals, companies and organizations to determine what measures are cost-effective. Based on this, in 1994–95 we took the lead in developing the national Voluntary Challenge and Registry Program. Work on this initiative will continue in the coming fiscal year.

Overall, it has been a busy and productive year for the Energy Ministry. The success we have achieved in carrying out our mandate is due in great measure to the efforts of all staff, whose expertise and commitment are recognized throughout government and the energy industry. I gratefully acknowledge their dedication and thank them for their contribution to the people of Alberta.

Patricia Black

Patricia Black
Minister of Energy

GOALS AND ORGANIZATIONAL STRUCTURE

The Department of Energy and the Alberta Energy and Utilities Board (AEUB) comprise the Alberta Ministry of Energy. As outlined in its Business Plan (1994–95 to 1996–97), the mission of the Energy Ministry is:

- To ensure energy and mineral resource development and use occur in an effective, orderly and environmentally responsible manner.

Mandate — The 1994–95 to 1996–97 Business Plan defines the mandate of the Ministry of Energy in terms of the following key responsibilities:

- Develop policy.
- Delineate and dispose of mineral resources.
- Collect the Crown's share of revenue from the exploration, development and sale of mineral resources.
- Regulate production practices and related sectors (including pipelines and utilities).
- Support research to enhance resource development and reduce environmental impacts.
- Manage Alberta's equity participation in oil sands and heavy oil projects.
- Monitor and assess Alberta's resource base and markets in support of the province's role in managing resource development, and encourage conservation, safe development and environmental protection.
- Ensure the fair, efficient and open assessment of resource development projects.
- Collect and disseminate data important to the ongoing management of Alberta's resource base.

Restructuring — A major restructuring in the Ministry of Energy went into effect during the 1994–95 fiscal year. The restructuring reduced the Ministry's 6 reporting agencies to 2 organizations — the Alberta Department of Energy and the Energy and Utilities Board. Key features of the restructuring included:

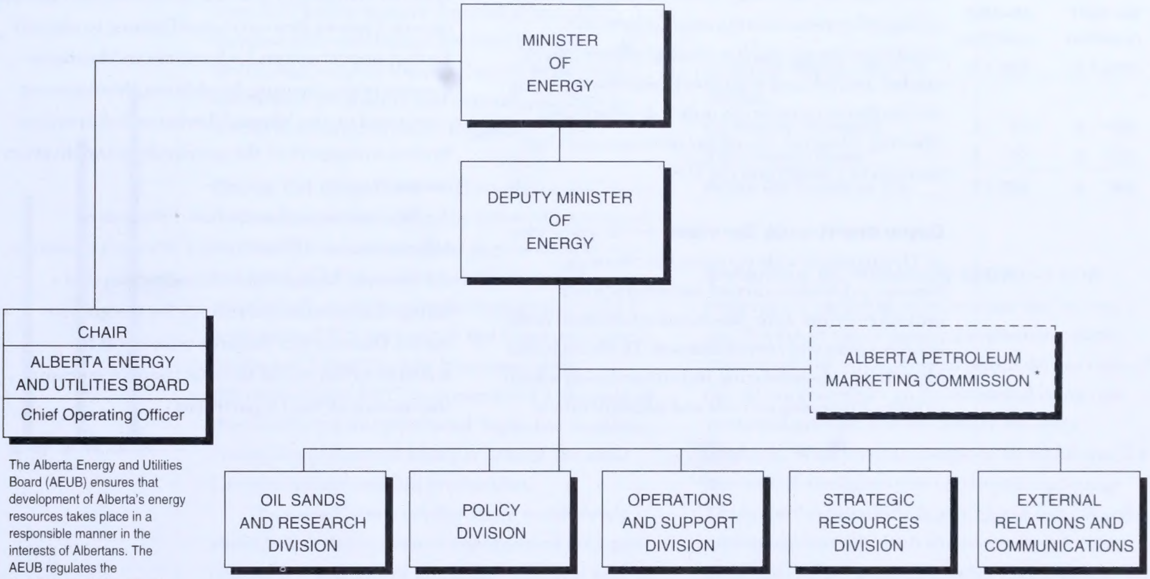
- Amalgamating the Energy Resources Conservation Board (ERCB) and Public Utilities Board (PUB) into a single quasi-judicial regulatory agency called the Alberta Energy and Utilities Board (AEUB).
- Discontinuing separate agency status for the Alberta Oil Sands Technology and Research Authority (AOSTRA).
- Discontinuing separate agency status for Alberta Oil Sands Equity (AOSE).
- Transferring the Alberta Geological Survey (AGS) from the Alberta Research Council to the Department.
- Creating the Oil Sands and Research Division within the Department. For the first time ever, the province's involvement in energy research and its equity investments in oil sands and heavy oil were brought together and coordinated. AOSTRA and AOSE activities form part of this division.
- Appointing a volunteer panel of industry experts to be known as the Energy Research Council. The Council advises the Department on priorities and strategies for government funding of energy research.
- Creating a new division within the Department called Operations and Support. This division brings together the bulk of the work previously performed across 2 former divisions (Mineral Resources and Mineral Revenues), plus amalgamation of business units from the Alberta Petroleum Marketing Commission into the Operations and Support organization.
- Creating a new division called Strategic Resources. This division recognizes that in a time of declining budgets, it is more important than ever to have sound and effective planning, efficient business processes and empowered employees. Strategic Resources Division is a "change agent" ensuring that the Department's

human and financial resources, information technology, office infrastructure support and planning activities are working in harmony to achieve the objectives of the Ministry.

- Creating a new division called External Relations and Communications.
- Strengthening the Policy Division. The division now includes the Regulatory Affairs section of the former Alberta Petroleum Marketing Commission. The Regulatory Affairs section functions as Alberta's advocate on regulatory issues in the energy field.

The restructuring represents only one component of a longer-term strategy to redefine the Ministry of Energy's operational interface with industry and meet the budget targets for the Ministry. Other activities include a comprehensive review of all energy-related regulations to streamline the regulatory process and provide "one-window" access for industry; pursuing an integrated and coordinated approach to energy research; outlining a vision and action plan for developing the oil sands; and re-engineering the Ministry's business and administrative processes.

Figure 1
Organization Chart


MINISTER OF ENERGY
DEPUTY MINISTER OF ENERGY
CHAIR
ALBERTA ENERGY AND UTILITIES BOARD
Chief Operating Officer
ALBERTA PETROLEUM MARKETING COMMISSION *
OIL SANDS AND RESEARCH DIVISION
POLICY DIVISION
OPERATIONS AND SUPPORT DIVISION
STRATEGIC RESOURCES DIVISION
EXTERNAL RELATIONS AND COMMUNICATIONS

The Alberta Energy and Utilities Board (AEUB) ensures that development of Alberta's energy resources takes place in a responsible manner in the interests of Albertans. The AEUB regulates the development of oil sands, oil, natural gas, pipelines, coal and electrical industries in Alberta and conducts hearings and inspections. It also regulates the fixed rates of investor-owned utilities and exercises general supervision over all utility companies operating in the province.

The Oil Sands and Research Division promotes the development of Alberta's oil sands and heavy oil resources. With advice from the Energy Research Council, comprising experts drawn from industry and the research community, the division promotes research and commercialization of research results relating to oil sands, heavy oil, hydrogen, coal and other energy resources. The division manages the Crown's equity interests in oil sands projects and promotes exploration for mineral resources by providing basic geoscience information.

The Policy Division provides analysis and advice on energy policies and programs, and represents the province in energy regulatory processes in other jurisdictions.

The Operations and Support Division is responsible for resource development policies, land use planning and for managing the disposition of energy and mineral development rights. It also administers mineral resource revenues received from rentals, sales, royalties and freehold taxes.

The Strategic Resources Division provides strategic financial, computer and administrative support services to the Department. This includes responsibility for long-range planning, information systems, human resources and office support services. It works to eliminate duplication of information in databases.

The External Relations and Communications Division supports the energy industry internationally, coordinates intra- and inter-government activities and stakeholder consultation, and provides corporate communication services.

** The regulatory and analysis functions of the APMC are being absorbed into the Department of Energy.*

Departmental Planning and Operations — As a result of the reorganization, all areas of the Department undertook comprehensive business reviews in consultation with their clients to assess their new roles. Staff were involved in determining organizational directions and the underlying values and principles of their areas.

The new structures that emerged from this process emphasized organizational efficiency, a more logical realignment of work functions, a team approach and a focus on client service. Reorganization of Gas Royalty Operations, for example, brought together teams from both the Operations and Support Division and Strategic Resources Division to create an organization based on client service. The addition of Regulatory Affairs to the Policy Division has allowed for enhanced communication on markets and regulatory issues, and has created efficiencies in market analysis and regulatory monitoring. It has also facilitated consistent policy development affecting Alberta's oil and gas revenues and the markets in Canada and the U.S.

Department-wide Services — As a provider of Department-wide services, the Strategic Resources Division carried out a number of initiatives in line with directions established in the business plan and reorganization. These included identifying, consolidating and streamlining administrative processes, records and administration.

Completion of the internal Electronic Communication Infrastructure Project allows all areas of the Department to communicate through a variety of office automation tools that provide electronic mail and word processing services. A long-term telecommunications plan was under way to provide efficient and effective electronic communications links between the Department's offices in Edmonton and Calgary.

Amalgamation activities reduced duplication and consolidated space for office functions and records management. This resulted in the termination of 2 office leases, providing significant savings to the government.

The Department carried out information systems planning in Mineral Resources land tenure, Human Resources and Finance to identify further opportunities for business and business process re-engineering. In addition, development continued on the Mineral Revenues Information System in support of the gas royalty simplification program.

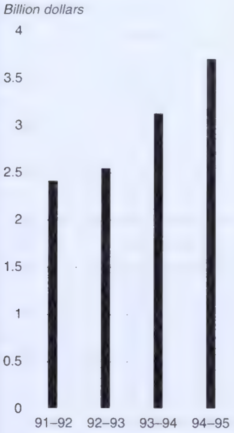
In preparation for the new Freedom of Information and Protection of Privacy Legislation, the Records Management Branch compiled a listing of departmental records for the government's Directory of Records which will be available to the public to assist them in accessing the records of the Department.

REVENUES

As owners of the province's natural resources, the people of Alberta are entitled to a fair return on the production of oil, natural gas, coal and other minerals. As a representative of the people, the Alberta Government, through the Department of Energy, has the responsibility to develop and manage programs to determine these revenues and to collect them.

Total Energy Revenues — Crown revenue in 1994–95 from all mineral resources was derived mainly from royalties and sales of Crown agreements for development of these resources. Net revenue for 1994–95 climbed to $3.7 billion from $3.1 billion the previous fiscal year. The increase reflected higher industry activity, including a surge in the purchase of leases and licenses for petroleum and natural gas rights as well as a climb in oil prices (Figure 2).

Figure 2
Energy Revenues



Crude Oil Royalties — The volume of Crown conventional oil produced in 1994–95 decreased by 2 million barrels from the previous fiscal year to a total of 277.4 million barrels. New Oil, primarily from reservoirs discovered since 1974, represented 77.3 per cent of the Crown volume produced. Third Tier Oil, from reservoirs discovered after 1992, represented 4.1 per cent of the Crown volume produced. Light and medium crude oil represented 84.6 per cent of the total Crown conventional oil production.

The gross Crown royalty share — Alberta's share before deductions — represented 20.5 per cent of the volume for the 1994–95 fiscal year compared with 19.9 per cent in 1993–94.

Net Royalty Volumes and Revenue — The net Crown royalty share reflects deductions from the gross Crown royalty share for Enhanced Oil Recovery (EOR) relief and the Oil Royalty Holiday programs that encourage exploratory and development drilling. The net share totalled 17.6 per cent, a volume of 48.7 million barrels. This compares with a rate of 14.7 per cent and a volume of 41 million barrels in 1993–94. Deductions decreased by 6.5 million barrels in 1994–95 compared with the previous year, primarily as a result of concluding the royalty holidays for development oil well drilling.

Revenues from the sale of royalty oil by the Crown totalled $1,096.8 million compared with $766.5 million for 1993–94 (Figure 3). This increase resulted from the effect of higher world oil prices, increased royalty volumes, reduced development royalty holidays and lower EOR benefits.

Figure 3
Net Crude Oil Royalty

	1994–95 (millions)	1993–94 (millions)
Crude Oil Royalty Revenue	$ 1,268	$ 1,066
Deduct:		
Oil Royalty Incentives	$ 74	$ 180
EOR Royalty Relief	$ 97	$ 120
Crude Oil Royalties Net	**$ 1,097**	**$ 766**

Enhanced Oil Recovery (EOR) — EOR projects are undertaken to increase the recovery percentage of the original oil in place in a particular reservoir. An average of about 46 per cent of the oil in a reservoir can be recovered using conventional primary and secondary recovery methods. With tertiary methods, an additional 14 per cent of the oil may be recovered on average. These methods include injecting gas and natural gas liquids that mix with the reservoir oil. Additional gas, called "push gas," is then injected to force this mixture and the resident oil to producing wells.

These tertiary methods are expensive, and the Crown shares in certain costs by reducing royalties on the tertiary oil produced from approved EOR projects. These royalty reductions are authorized under the Enhanced Recovery of Oil Royalty Reduction Regulation.

Crown Conventional Oil is oil recovered under authority of a Crown lease, using primary production techniques.

For the 1994–95 fiscal year, industry received $97 million in royalty relief (Figure 3). This relief is provided in kind, meaning that EOR project participants receive oil in lieu of cash. For the 1993–94 fiscal year, industry received $120 million in relief. The decline in relief for the approved projects in 53 pools was primarily due to declining costs as these projects mature. Roughly 92,000 barrels per day of tertiary oil were recovered from these projects in 1994–95, compared to 105,000 barrels per day in 1993–94.

Synthetic Crude Oil and Bitumen Royalties — Revenue in 1994–95 totalled $223 million from production and sales of synthetic crude oil and bitumen products including a royalty settlement pertaining to the 1984 Syncrude fire. The substantial increase in royalty revenue from $66 million in 1993–94 is due mainly to higher world oil prices. The two Fort McMurray synthetic crude oil sands plants accounted for 84 per cent of the total oil sands royalty revenue. Both plants set record high production levels during 1994. (See non-conventional activity— Page 17.)

Natural Gas and Byproduct Royalties — Overall gross natural gas and byproduct royalty revenues declined to $1.8 billion for 1994–95 from $1.9 billion in the previous fiscal year. The decline in revenues was due to a price decrease of 25 per cent in 1995, partially offset by an increase of 10.35 per cent in volume. Net natural gas and byproduct royalties decreased to $1.242 billion from $1.410 billion in the previous fiscal year (Figure 4).

Gas Cost Allowance — Gas Cost Allowance is a deduction allowed by the Crown for gathering, compressing and processing the Crown's share of natural gas and associated byproducts. It is deducted from royalties payable on an estimated basis. The actual allowance is then calculated and reconciled for each calendar year. The allowance is subtracted from gross royalties to arrive at net royalties payable. In 1994, Gas Cost Allowance totalled $544 million, up five per cent from $517 million in 1993.

Figure 4
Gas Royalties

	1994–95	1993–94	% Change
	($millions)		
Gas and Products Royalties	1,786	1,927	–7.3
Deduct			
Gas Cost Allowance	544	517	5.0
Net Gas Royalties	**1,242**	**1,410**	**–11.9**

Coal and Other Royalties — Coal royalty revenue in 1994–95 totalled $14.4 million, an increase of $0.8 million over the previous fiscal year. The marginal increase is due to a reduction in the operating costs for bituminous coal mines which pay royalties based on their net revenues.

Freehold Mineral Rights Tax — The Freehold Mineral Rights Tax is calculated according to a calendar-year, based on the value of the petroleum and natural gas recovered from freehold lands. For the 1993 taxation year, 5,600 freehold titles produced tax assessments of $87.3 million, with net tax realized totalling $83.8 million. In 1994, a total of 6,943 titles generated a tax levy of $105.5 million, which consisted of $54.5 million from natural gas rights and $51 million from petroleum rights. The net tax for 1994 was $102 million, $3.5 million less than the total levy because of tax incentives associated with enhanced oil recovery activity and revisions for prior years.

Revenues Assurance — Crown revenues are audited to ensure they are complete, accurate and fairly valued. During 1994–95, approximately $65 million of royalty and tax audit recoveries, net of possible appeals, were collected. This represents a return of $25 per $1 of audit expenditure.

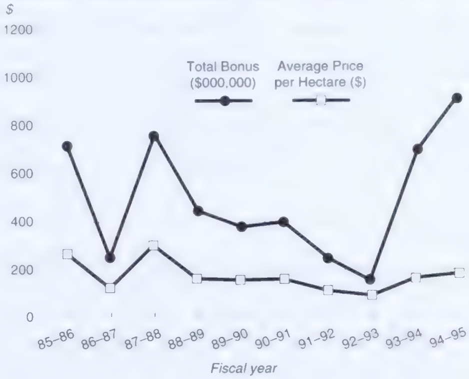
Synthetic Crude Oil is produced from a heavy hydrocarbon called "**bitumen**" which saturates beds of sand in the Athabasca, Peace River and Cold Lake deposits in Alberta. At room temperature, bitumen has the consistency of very cold molasses. During processing, the carbon level of the bitumen is reduced and the hydrogen level increased. The result is synthetic crude which has properties similar to a high-grade conventional crude oil.

Freehold Minerals: Mineral rights not owned by the Alberta Crown are called "freehold." They cover about 19 per cent of the 66 million hectares of land in the province. Freehold rights are owned by the federal government within national parks and on behalf of Aboriginals within Indian reserves, by the Hudson's Bay Co. and national railway companies. They also result from federal grants to original homesteaders.

Public Offering of Petroleum and Natural Gas Rights — Revenues from the public offering of 11,175 petroleum and natural gas agreements during the 1994–95 fiscal year climbed to $971 million from $712 million in the previous year. These rights sold for an average of $195 per hectare against $184 the previous year. A 10-year comparison of the revenues received for the public offering of petroleum and natural gas rights is shown in Figure 5.

Four areas in the northern and western parts of the province attracted significantly higher-than-average revenues for petroleum and natural gas rights. In the Hinton area, 14 parcels sold for a total of $24.9 million at an average price per hectare of $894; in the Fox Creek-Edson area, 34 parcels sold for a total of $23.5 million at an average price per hectare of $803; in the Grande Prairie-Hythe area, 31 parcels sold for a total of $19.7 million at an average price per hectare of $1,640; and in the Utikuma Lake area, 12 parcels sold for a total of $5.9 million at an average price per hectare of $966.

Figure 5
Public Offering of Petroleum and Natural Gas Rights
Average Price per Hectare and Total Bonuses by Fiscal Year



MINERAL AGREEMENTS

The Alberta Crown owns mineral rights covering approximately 81 per cent of the 66 million hectares in the province. Mineral rights not owned by the Alberta Crown are termed "freehold." Whether publicly or privately owned, mineral resources in Alberta have always been privately developed. Before minerals owned by the Alberta Crown can be developed or recovered, the developer must hold an agreement for those minerals, although an agreement is not necessary to perform geophysical work.

Petroleum and Natural Gas Agreements — The Operations and Support Division issues two types of petroleum and natural gas agreements: licenses and leases. Both types may be acquired at sales by public tender.

Petroleum and natural gas leases have a 5-year term. Petroleum and natural gas licenses, however, have terms of 2, 4, or 5 years in the Plains, Northern and Foothills areas of the province, respectively. This feature recognizes that access to land is year-round on the Plains and seasonal elsewhere.

Public Offerings — During the 1994–95 fiscal year, the Department held 29 public offerings (including 4 in addition to those originally scheduled) in Calgary and sold 11,175 petroleum and natural gas agreements, up from 8,833 the previous year. These agreements, comprising both leases and licenses, encompassed 4.98 million hectares, the highest ever recorded (Figure 6).

Direct Purchases — During 1994–95, 10 leases containing 576.5 hectares were issued by way of direct purchase.

Primary Term Expiries — Shortly before a petroleum and natural gas lease reaches the end of its primary term, the lessee may apply to the Operations and Support Division to have the lease continued, based on proven productivity. Petroleum and natural gas rights considered by the division to be productive are continued to the base of the deepest productive zone. Unproductive rights revert to the Crown.

During the 1994–95 fiscal year, 5,251 primary-term leases comprising 1,876,544 hectares, expired. Approximately 69.1 per cent, or 1,297,885 hectares, were not proven productive and reverted to the Crown. Figure 7 shows a breakdown of actions on expiring leases.

Continued Leases — The Mines and Minerals Act provides for monitoring the petroleum and natural gas leases that have been continued. When

Figure 6
Petroleum and Natural Gas Parcels and Hectares (000) Sold

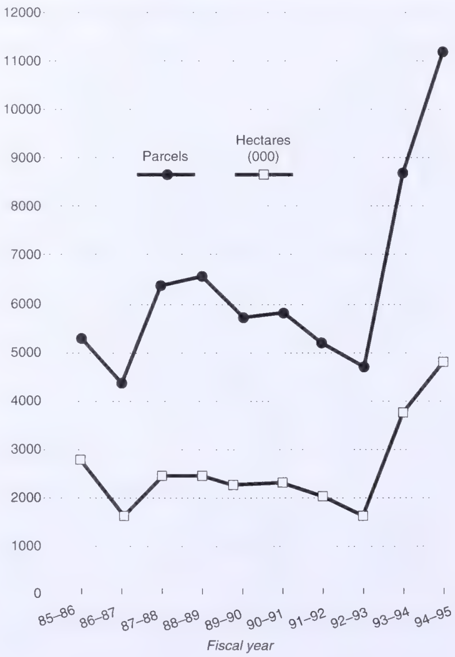


Figure 7

Expiring Primary Term Petroleum and Natural Gas Leases in 1994–95 Fiscal Year

	Leases	Hectares	Per Cent of Total Hectares
Continued based on proven productivity	1,209	342,897	18.27
Continued based on drilling operations near the end of the term	203	87,041	4.64
Continued as potentially productive	453	144,369	7.7
Term of lease extended	1	4,352	0.23
Not continued (cancelled)	3,385	1,297,885	69.16
Total	**5,251**	**1,876,544**	**100**

productivity of a lease is in doubt, the Minister may serve a one-year notice stating that the lands or rights will revert to the Crown unless the lessee can provide evidence of productivity. During the 1994–95 fiscal year, 754 non-productivity notices were served affecting 258,652 hectares.

In addition, 759 non-productivity notices of one-year duration served in the 1993–94 fiscal year expired, affecting 335,294 hectares. As a result, 12 wells were drilled and an additional 2 wells were re-entered or recompleted prior to the end of fiscal 1994–95. Eighty per cent of the affected hectares reverted to the Crown and thereby became available for further acquisition.

Offset Drilling Obligations — When a well is drilled on freehold rights and is put in production, it has the potential to drain petroleum or natural gas from adjacent Crown mineral rights. This creates an offset drilling obligation for Crown leases. To protect the interests of Albertans, the Crown lessee is given the option of drilling a well, paying compensatory royalty in lieu of drilling, or surrendering lands or rights to satisfy the offset obligation. During the 1994–95 fiscal year, 874 freehold oil wells were reviewed and 28 oil offset default notices were served. As a result of these notices, 8 lessees elected to pay compensatory royalty, 13 surrendered the petroleum and natural gas rights, 4 drilled wells, and 3 notices were withdrawn.

During the same period, 421 freehold gas wells were reviewed and 93 gas offset notices were served. As a result of these notices, 45 lessees elected to pay compensatory royalty, 23 surrendered the petroleum and natural gas rights, 14 drilled wells and 11 notices were withdrawn.

During the fiscal year, 1,162 petroleum and natural gas posting requests were reviewed and 60 oil offset and 99 gas offset notices were served. As a result, 79 lessees elected to pay compensatory royalty, 53 drilled wells, 15 surrendered the petroleum and natural gas rights, and 12 notices were withdrawn.

Unit Agreements — A number of parties, including the Alberta government, can have an interest in a single oil or gas pool. Unit agreements are useful tools for achieving the highest possible oil and gas recovery while ensuring that all parties recover an equitable share of the resource.

All proposed unit agreements in the province are reviewed, negotiated and executed on behalf of the Minister by the Operations and Support Division. During the 1994–95 fiscal year, 15 new unit agreements became effective and 6 existing ones were enlarged. At fiscal year-end, the Alberta government was party to 624 units.

Oil Sands Leases — During the 1994–95 fiscal year, the Operations and Support Division administered 381 oil sands leases. One hundred and sixteen of these leases are in their second 21-year term and will expire between 1996 and 2012. Each second-term lease is required to be in production at a specified capacity in order to enter its third term. These leases encompass approximately half of both surface-mineable and non-surface-mineable oil sands reserves. During the fiscal year, only 2 second-term oil sands leases produced at or above their prescribed capacity. Four other second-term leases produced at less than their specified capacities, while the balance did not produce at all.

Eight public offerings of oil sands were held during the period. Sixty-five agreements covering 66,113 hectares sold for $7,210,099.

Coal, Metallic and Industrial Minerals — The Operations and Support Division issued 766 metallic and industrial minerals permits during the 1994–95 fiscal year. This brought the total number of active permits to 4,337, covering an area of 37.8 million hectares, which represents about 75 per cent of the Crown mineral land base. The exploration targets for these agreements are primarily diamonds and gold.

The number of coal leases administered by the division decreased during the fiscal year as a number of companies rationalized their lease holdings. There were 1,655 active coal leases covering 649,700 hectares at the end of the fiscal year, compared to 1,700 leases on 664,000 hectares the previous year. No new coal leases were issued, but 154 were renewed.

The division administered 63 ammonite shell agreements comprising 6,730 hectares of rights during the fiscal year. Ammonite shell of jewellery quality is Alberta's gemstone. It is also a palaeontological resource under the Historical Resources Act.

Industrial mineral leases holdings remained relatively stable during the year. The division administered 85 leases covering 12,650 hectares for such commodities as salt, sodium sulphate, limestone and building stone.

RESPONSIBLE REGULATORY FRAMEWORK

The Government of Alberta followed up the major changes to the oil and gas royalty regime made in 1993–94 with a number of revisions designed to reduce the administrative needs and costs to both industry and government.

- Natural gas royalty simplification was implemented with enactment of the *Natural Gas Royalty Regulation, 1994.*
- Subsequent changes were made to the *Natural Gas Royalty Regulation, 1994*, to reduce royalty rates on associated gas from very low productivity oil wells to the equivalent rate for low productivity gas wells. These came into effect January 1, 1995.
- The Alberta Royalty Tax Credit (ARTC) program was extended with a three-year notice provision for any major program changes. The qualifying cap was reduced to $2 million with the maximum eligibility dropped from 85 per cent to 75 per cent based on a blended gas/oil price.
- The Crown's program to encourage efforts to increase oil recovery using tertiary recovery methods was simplified and clarified with the enactment of the *Enhanced Recovery of Oil Royalty Reduction*, effective January 1, 1994. Previously, this program was addressed only briefly in the *Petroleum Royalty Regulation.* (Tertiary methods are used to supplement the natural reservoir energy so that additional amounts of oil can be recovered. These methods may include injection with steam, carbon dioxide, various fluids, or in situ combustion.)
- The development holiday aspect of the *Oil Royalty Incentive Regulation* was a transitional measure to maintain activity levels during a period of unusually low gas-directed drilling. It was originally set to expire on March 31, 1993, but was extended to August 31, 1993 due to delays in drilling season because of the weather. The benefits for qualifying wells will continue to flow up to April 1, 1996.
- The Crown's test program modifying royalty calculations for horizontal wells, provided for in the *Horizontal Well Petroleum Royalty Regulation*, was extended to December 31, 1994 to allow for completion of an analysis. The program was not replaced. Qualified wells will continue with the modified royalty formula until December 31, 1996.
- The royalty provisions associated with mining miscellaneous minerals were consolidated into the *Metallic and Industrial Minerals Royalty Regulation.* Previously, the royalty provisions associated with these minerals were contained in several different regulations.
- The Alberta Gas Storage Task Force issued its findings and recommendations in December 1993. Government–industry discussions continued in 1994. Changes to the *Mines and Minerals Act* were made in 1994 to clarify ownership of storage reservoir space, and allow a standard agreement to set out the rights of storers and producers.
- A study on the economics of mature oil and gas properties was started in late 1994. Government and industry are currently modelling a number of actual properties to determine the impact of government charges and policies on the continuing operation of the properties.

Intra-Alberta Core Market Policy — The Department finalized its policy on direct sales of natural gas to core markets during the 1994–95 fiscal year. Cabinet approved regulations on March 13, 1995, that will allow all consumers in Alberta the option of either purchasing their natural gas requirements from their local utility or from another supplier. Details of direct sale arrangements were to be determined at a subsequent hearing of the Alberta Energy and Utilities Board.

Removal Permits — An Alberta Gas Removal Permit is required to export natural gas from the province. The Alberta Energy and Utilities Board (AEUB) and the Department of Energy work together to issue these permits. In 1994–95, more than 500 removal permits were issued, compared with more than 700 in 1993–94, and approximately 1,000 the preceding year. This decline in part reflects the Department's streamlining of information requirements. The requirement to file detailed downstream arrangements with the Department before a permit is issued was dropped in March 1995. The AEUB and the Department are continuing a review to simplify and streamline the permit approval process.

Pipeline Expansions — There were no major expansions of pipelines carrying Alberta natural gas in 1994–95. Four smaller expansions of export pipeline capacity, at Iroquois, Niagara Falls, Chippewa, and Napierville in Eastern Canada, added a total of 231 million cubic feet a day to export capacity. TransCanada Pipelines also added 33 million cubic feet a day of domestic delivery capacity.

NOVA Legislation — Legislation passed in 1994–95 brought NOVA Gas Transmission Ltd. (NGTL), Alberta's primary natural gas transmission system, under full regulation by the Alberta Energy and Utilities Board (under the Gas Utilities Act) on January 1, 1995. Hearings on NGTL's 1995 tolls were set for the summer of 1995.

Pipeline Expansion and Market Growth — In 1994–95, the Regulatory section participated in proceedings related to proposed expansions of the TransCanada, Northern Border, and Pacific Gas Transmission systems, and the proposed construction of the Wild Horse pipeline — the Canadian link between NOVA and the proposed Altamont project in the U.S. The Regulatory section also participated in National Energy Board hearings related to applications for long-term export licenses.

Toll and Rate Design — This area directly affects Alberta producer netbacks and royalty revenues. In 1994–95, the Regulatory section actively participated in the multi-pipeline cost of capital hearing conducted by the National Energy Board of Canada. It continued to advance Alberta's arguments for rolled-in tolls on the Pacific Gas Transmission and Pacific Gas and Electric Company expansions at hearings before U.S. regulatory authorities. The Regulatory section continued to work with the Canadian Association of Petroleum Producers at hearings before the U.S. Federal Energy Regulatory Commission to develop more competitive and mileage-sensitive rates on the major U.S. pipelines carrying Canadian gas. The section also continued its work on numerous industry/pipeline task forces aimed at resolving tolling and rates issues prior to hearings, and participated in the development of NOVA Gas Transmission Ltd.'s new collaborative process.

Oil Pipeline Apportionment — During 1994–95, Alberta producers continued to face high levels of apportionment on the Interprovincial Pipe Line (IPL) pipeline system, Alberta's main oil export link to the United States and central Canada. Every month, producers and shippers have to tell IPL in advance how much oil they expect to ship through the pipeline. The amount of space that is actually allotted to them by IPL is their "apportionment." Monthly apportionment in 1994–95 averaged 47 per cent, up from 37 per cent in 1993–94. High apportionment levels have hampered Alberta producer's marketing efforts, resulting in lower netback prices for Alberta crude oil sales.

Late in 1994–95, two developments were under way to address the apportionment problem. The National Energy Board of Canada had scheduled a hearing to review the IPL apportionment procedures and regulations. The second initiative was action taken by the Ministry on behalf of industry to market additional volumes of crude oil to non-IPL markets, thus freeing up capacity on the IPL system. The combined impact of both developments was expected to result in a significant reduction in apportionment for the 1995–96 fiscal year.

Electric Industry Restructuring — Alberta's electric industry has been the focus of intense discussion since 1990. The main areas of discussion centered on how new generating plants are planned and approved, the averaging of generation and transmission costs under the Electric Energy Marketing Act (EEMA), and whether Alberta's electric industry structure and regulatory framework are adequate to respond to competitive market forces.

Early in 1994, the Minister of Energy established two objectives for the process:

- Find a replacement for EEMA that is fair from a province-wide perspective.
- Introduce industry structure and regulatory reforms that preserve and enhance the "Alberta Advantage" of competitive electricity prices.

The Minister asked a Steering Committee representing a broad cross section of industry and consumer groups, including utilities, to identify and review alternatives in working towards these objectives. The Minister also consulted mayors and municipal representatives from across the province.

In October 1994, the Department of Energy circulated a consensus proposal developed by the Steering Committee, entitled: *Enhancing the Alberta Advantage: A Comprehensive Approach to the Electric Industry*, for comment. The responses received from stakeholders were overwhelmingly supportive.

In December 1994, Cabinet endorsed the consensus proposal for implementation January 1, 1996. The Department is working closely with the Steering Committee in converting the consensus proposal into draft wording for the Electric Utilities Act and the EEMA Repeal Act.

The main elements of the draft legislation include:

- *Replacement of the EEMA cost averaging mechanism.* EEMA will be phased out as regulated generating units are retired. Until then, all customers, old and new, will continue to share in the low cost of regulated generation no matter where they are located.
- *Open system access and competitive power pool.* Open system access will provide distribution systems and generators with access to the "power pool" to buy and sell electric energy. All generation owned by independent power producers, not just generation owned by utilities, will be able to compete to supply electric energy to the power pool.
- *Competition for new generation.* Distribution systems will seek new financial arrangements with generators through competitive processes.
- *Regulatory Reforms.* The Alberta Energy and Utilities Board will have increased flexibility to approve tariffs that give utilities increased incentives for efficiency (incentive regulation), and the authority to allow stakeholders to resolve matters in a less costly manner than formal hearings before the Board (negotiated settlements).

Coal Strategies and Actions — The Department has responsibility for ensuring that coal resource development and use occur in an effective, orderly and environmentally responsible manner. The primary goal is to maximize the value of Alberta's coal industry to provide greater benefits to Albertans.

The Department's coal development strategy, created in close consultation with Alberta coal producers, was endorsed by the Minister of Energy in January 1995. The Department formed an interdivisional working group to meet with Alberta coal producers and identify and seek resolution of issues that affect the coal industry, which arise from the government's existing and proposed laws, regulations and policies.

OIL SANDS DEVELOPMENT

As the supply of conventional oil in North America is depleted, consumers will be able to turn to non-conventional sources of petroleum to avoid a growing dependence on resources abroad. Fortunately, Alberta has huge deposits of oil sands that underlie about 77,000 square kilometres in the province and contain about 1.7 trillion barrels of oil in place, of which approximately 300 billion barrels are ultimately recoverable.

In encouraging the development of this oil sands resource, the Government of Alberta's main objective is to promote sustainable and environmentally sensitive development using the best available technology. Alberta's strategy of oil sands development is aimed at unlocking the massive resource potential for the long-term prosperity of the province.

Oil Sands Initiatives — Alberta continued its involvement in the National Task Force on Oil Sands Strategies. The task force was created in January 1993 to identify new concepts, technologies and strategic approaches to further the development of Alberta's oil sands. The task force is industry-led and includes representation from all industry stakeholders plus the governments of Alberta and Canada. The task force worked on preparing a report outlining strategies to triple production from the oil sands over the next 25 years by addressing barriers to development in areas such as technology, transportation, regulatory concerns, and environmental issues.

During the 1994–95 fiscal year, the Province of Alberta signed a Crown agreement with Koch Exploration Canada Ltd., and continued to assist new entrants such as Solv-Ex Corporation, Elan Energy, and Texaco Canada Petroleum Inc. concerning future activity in Alberta's oil sands.

As well as supporting policy development and promotion of new activity in the oil sands areas, the Department continued throughout 1994–95 to own an equity interest in Syncrude. Alberta is a joint venture partner in Syncrude, owning 11.74 per cent. At fiscal year-end, the Province was considering offers of purchase for its interest in the project.

Non-conventional Activity — Bitumen prices rose 51 per cent to average $14.60 a barrel in 1994–95, while heavy crude prices rose 32 per cent to average $18 a barrel. Light crude and synthetic crude oil also experienced higher prices throughout the year, increasing by approximately 15 per cent. As a result, the light/heavy oil price differential narrowed to a fiscal year average of less than $3.50 a barrel in 1994–95 from approximately $6.50 in 1993–94.

The two integrated surface mining oil sands plants in Alberta — Suncor Inc. Oil Sands Group and Syncrude Canada Ltd. — both set production records. In 1994, Suncor Inc. produced a record 25.8 million barrels of synthetic crude oil. Syncrude Canada Ltd., produced 69.7 million barrels of synthetic crude oil, an increase of 30 per cent since 1990. It was Syncrude's fifth consecutive year of record-setting production levels. The more than 94.9 million barrels of synthetic crude oil produced by the two oil sands mining operations represented approximately 15 per cent of Canada's total crude oil production. Bitumen production from in situ projects totalled more than 136,600 barrels per day (50 million barrels a year), bringing total production from the oil sands to approximately 400,000 barrels per day. This represented 22.5 per cent of the oil produced in Canada.

Renewable Energy Development — Renewable energy development is another aspect of non-conventional activity, as the Department continued some of the activities formerly carried out by the Southwest Alberta Renewable Energy

Initiative (SWAREI). This four-year renewable energy program concluded its final year of operation in 1993–94.

In 1994–95, the Department provided funds for the Alberta Renewable Energy Test Site run by Lethbridge Community College and to assist in the transfer of the former Alberta Office of Renewable Energy Technology Information Centre to the Town and Municipal District of Pincher Creek. A 9.9 megawatt wind farm, developed by Kennetech Windpower Inc. and supported by SWAREI, went into operation in 1994 on Cowley Ridge near Pincher Creek and became the largest wind farm in Canada.

Lloydminster Bi-Provincial Upgrader — The Government of Alberta took action, effective April 10, 1994, to stop making cash contributions to the Bi-Provincial Upgrader located in Lloydminster, Saskatchewan. The Upgrader had been experiencing ongoing operating shortfalls. The Province of Alberta sold its 24.17 per cent interest in the Upgrader to the Government of Saskatchewan and Husky Oil Ltd. for $32.02 million. The sale was based on terms of an agreement among the 4 joint venture parties: the federal, Saskatchewan and Alberta governments, and Husky Oil Ltd. Alberta has no further obligation to the project or ongoing liability for the operation of the Upgrader. The upgrader continues to be managed by CIC Industrial Interests Inc., a company wholly owned by the Government of Saskatchewan and Husky Oil Ltd., and continues to provide a market for heavy oil produced in Alberta.

Oil Sands Information — The Alberta Oil Sands Information Services (AOSIS) handled more than 4,700 requests at its offices in Edmonton and Calgary in 1994–95. Forty-eight per cent of these requests were from industry, 28 per cent from the Department of Energy, 7.5 per cent from the Alberta Research Council, 7.5 per cent from educational organizations, 7 per cent from government and 2 per cent from the public. A significant number of requests, 13.5 per cent, came from outside Canada.

AOSIS was established in 1975 with the mandate to acquire, organize, and supply public information on oil sands development, both Canadian and international, to parties interested in oil sands research. The result was the Alberta Oil Sands Index, a database of more than 15,000 records. In 1982, the mandate was extended to include Canadian information on heavy oil and enhanced oil recovery.

STRATEGIC RESEARCH

The newly established Oil Sands and Research Division brings together and coordinates the Alberta government's involvement in energy research, its equity investments in the oil sands, its geoscience information base and other Alberta Geological Survey activities. The division's role is part of a strategic plan that recognizes the importance of the province's oil sands and mineral resources, and Alberta's reputation as a leader in energy research and data collection as well as its technical expertise in the energy field.

In Situ Operations — A major responsibility of the Department is to work with industry and other organizations to develop new technology needed for commercially producing the 95 per cent of Alberta's oil sands that are too deeply buried for surface mining.

The Athabasca oil sands near Fort McMurray, containing more than 1 trillion barrels of bitumen, has become accessible at greater depths by using the Steam Assisted Gravity Drainage (SAGD) technology with shaft and tunnel access developed at the Underground Test Facility near Fort McMurray. Nine industrial participants are involved in the Phase B test program of SAGD which started in 1992. Bitumen production has reached the designated capacity of 2,000 barrels per day. Industry participants have been invited to submit bids to become the operators of the project and carry the technology to the commercial stage.

Shell Canada has started an enhanced version of the SAGD process next to its commercial plant in the Peace River oil sands. Testing of the process continued during 1994–95 using horizontal wells drilled from the surface to achieve improved economics for the next expansion of the commercial operation.

In the thinner Wabasca oil sands, Amoco continued its testing of an in situ combustion pilot plant using a horizontal combustion well located between 2 parallel production wells.

Heavy Oil Recovery — A project to develop a combination cyclic steam/steamflood heavy oil process in the Bodo field south of Lloydminster was completed on December 31, 1994. The project, started in 1985 by the Alberta Oil Sands Technology and Research Authority (AOSTRA), Norcen Energy Resources and 3 other industrial partners, recovered more than 55 per cent of the original oil from the enclosed central area.

Testing continued at the end of the 1994–95 fiscal year on a project at Frog Lake, north of Lloydminster, using electromagnetic energy to heat the heavy oil in situ. The project by Texaco and the Department involves 3 slant wells and a 500-metre horizontal well. After establishing baseline production data on primary recovery, electrical power has been applied to the formation through each of the slant wells.

Enhanced Recovery — The Department is also working with industry on a number of projects to develop and field test advanced technology for increasing the ultimate recovery of conventional oil and for prolonging the economic life of wells that would otherwise be abandoned. These include horizontal well drilling projects, the Vikor Resources Joffre miscible CO_2 flood, the Ulster Petroleum Retlaw Immiscible CO_2 flood, the Crestar Energy Cessford caustic polymer flood, and the Gulf Canada Resources Fenn-Big Valley nitrogen injection project.

Upgrading, Mining and Extraction — Upgrading of bitumen to a high-grade synthetic crude is important in reaching wider markets, obtaining more stable netbacks and maximizing the value-added aspect within Alberta. Due to high capital and operating costs, upgrading remains the highest cost component in the production of synthetic crude oil. Two projects were under way aimed at developing technology to reduce these costs: the HC_3 process being developed at the Alberta Research Council, and the hydrotreating pilot plant test program to provide a process design database on AOSTRA/Taciuk Processor (ATP) distillate products.

Extraction research was conducted with Bitmin Resources to test a counter-current drum separator for oil sands bitumen extraction and sand reduction. In another project, Solv-Ex Corporation demonstrated its process on a continuous basis for processing oil sands for bitumen recovery, metals extraction and generating clean, dry residue.

Institutional Liaison — The University Research Program provides support to university faculty members to conduct research with graduate students relating to petroleum recovery and processing. In the 1994–95 fiscal year, the program maintained funding on 18 research projects ranging from geology to development of processes for upgrading, in situ combustion and control of water flooding.

Three centres of expertise were supported at the Alberta Research Council: in situ oil sands and heavy oil recovery, geological evaluation of Alberta's oil sand resources, and conversion of Alberta's heavy oil and bitumen to saleable products.

Alberta Geological Survey (AGS)

The AGS became part of the Department on March 1, 1995, through a transfer of administration from the Alberta Research Council. During the 1994–95 fiscal year, AGS developed new long-term goals and restructured itself in line with the Department's mission and mandate. It is now organized into the following work groups: Geoscience Information Base, Land Use Planning and Environmental Support, Exploration and Development Support, and Program Support. Close links were established with the Mineral Access Geology and Mapping Group in the Department's Oil and Gas Administration Branch.

1994–95 Projects — The Alberta Geological Survey Geoscience Information Base Group undertook two new major initiatives: establishing a presence on the Internet; and moving to new computing platforms.

Projects carried out by the AGS included a series of resource characterization studies in the Athabasca oil sands area. The resulting electronic database, now available to the public, contains detailed information on about 2,200 wells.

Other projects included computerized compilation maps including information on geological characteristics, natural resources, and other information important for the environmentally responsible development of geological resources; evaluation of groundwater resources to support oil sands and heavy oil resource development; and systems to provide information in areas of groundwater-use conflict.

Geological Atlas — The AGS worked with the Canadian Society of Petroleum Geologists, the Alberta Research Council, Alberta Energy and the Geological Survey of Canada to produce the Geological Atlas of the Western Canada Sedimentary Basin. British Columbia, Saskatchewan and Manitoba also provided support. The Atlas contains approximately 500 maps, more than 200 cross-sections, and numerous specialized figures and tables. To date, over 2,000 copies have been sold.

Canada-Alberta Partnership on Minerals — The Canada-Alberta Partnership on Minerals, signed in 1992 between the Alberta and federal governments, provided additional public geoscience information about Alberta's industrial and metallic mineral occurrences for the exploration industry and developers. The third year of the program (1994–95), saw the completion of 10 projects. Fourteen projects were supported in total, including 11 geoscience projects, 2 technology development projects and 1 economic development project.

Geoscience research included such projects as a summary review of diamond potential in Alberta; a review of the gold potential in northeastern Alberta; industrial mineral potential from brines; and mapping of mineral resources in the main mountain corridors of the province. The study of industrial minerals from brines identified calcium, magnesium, bromine and lithium as worthy of additional interest by industry, based on exploration results and a review of current market conditions for these minerals.

Industry interest in the program has been high, as shown by the purchases of project reports, the sales of mineral leases and the increase in exploration.

Technology development projects supported further development of a novel process for gold upgrading using agglomeration technology. The single economic development project was a diamond market study.

Program results have inspired the mineral exploration industry to increase their exploration efforts in Alberta. Reports describing the wider ranging funded projects are available to the public.

Coal Research

The Department continued the Alberta Coal Research Program in close cooperation with industries that produce or use coal. The program's major focus is on the reduction of coal-related emissions to the environment. It also focuses on maintaining the competitiveness of Alberta coals in domestic and external markets, and on finding new uses for Alberta coals. The Department supported projects carried out and partly funded by the private sector and other governments to help Alberta's coal producers and coal users remain competitive in both domestic and international markets.

Emissions — Five of the 11 active projects focused on reducing emissions from the use of Alberta coal for power generation. Two investigated the occurrence of trace elements in the feed coal of power generation stations, and the impact of these elements on the environment. Initial results showed that the concentrations of these elements are low in Alberta coals and do not pose a particular problem. Other research showed that Alberta coals are well suited for use as "reburn fuels," converting nitrogen oxides to harmless nitrogen in boilers fired by fossil fuels.

Researchers from the University of Calgary assessed the option of making significant reductions in carbon dioxide emissions by simultaneously producing electricity and cement through the addition of limestone and other additives to the feed coal in power generation stations. While the process shows promise technically, the economics of co-production of cement and power still need to be evaluated.

Clean Coal Technologies — The Department participated in research in support of potential coal gasification technologies during 1994–95. CANMET and the Alberta Research Council worked under cost-sharing arrangements with Canada's utility industry to focus on suitable materials and process modelling.

Another study, conducted in cooperation with TransAlta Utilities, assessed potential repowering options that could be used by existing generation stations when they reach the end of their useful operations using conventional processes. Results indicated that one new process, the Kalina Cycle, offers a serious alternative to other new power generation options.

The program also contributed to a new initiative to develop novel fossil fuel combustion and power generation technologies with enhanced carbon dioxide recovery. This research is ongoing, supported by an industry–government consortium. Good progress was also achieved with a comprehensive evaluation of existing coal preparation plants, and development and testing of on-line coal analysers. This research helps industry to remain competitive, increase its efficiency and recover considerable amounts of fine coals that would otherwise be lost.

New, Cost-Effective Uses — An evaluation of coals from Alberta and other parts of Canada for injection into blast furnaces has confirmed that Alberta coals have characteristics that are preferred for use in pulverized coal injection technology which is being applied more and more by steel manufacturers worldwide. These results also enhance the competitiveness of Canada's coal producing industry in world markets.

Hydrogen Research

The Alberta Hydrogen Research Program, which is cost-shared with industry, aims to make Alberta's energy and resource industries more competitive. Its overall objective is to develop Alberta's industrial base further by using hydrogen as a principal link for integrating the energy resource industry.

Hydrogen Production/Separation — A major focus of the program is on developing hydrogen sulfide dissociation technologies for the production of hydrogen and sulfur. While the investigations of potential electrochemical and direct conversion processes can still be classified as fundamental and pre-competitive, a small-scale field or pilot demonstration project has been launched using the thermal decomposition process. This project, conducted by Alberta Sulphur Research Ltd., has created considerable interest within industry in Canada and other countries. Results from the project show good hydrogen sulphide conversion rates that are close to process equilibrium. Further work on separation technologies is needed before the technology can be commercially implemented.

Hydrogen Collection, Transportation, Distribution — Although it does not provide financial support, the Alberta Hydrogen Program continues to monitor a major hydrogen pipeline pilot project constructed by Praxair Canada Ltd. between Edmonton and Fort Saskatchewan, which is scheduled for start-up in the fall of 1995. In another project, a university-industry consortium is studying an expensive problem for industry: the deterioration (embrittlement) of steel that is exposed to hydrogen and hydrogen sulfide.

Hydrogen Utilization/Optimization — The third major focus of the Hydrogen Research Program is to optimize the use of hydrogen in upgrading Alberta's heavy oils and bitumen resources. Because hydrogen is the single highest cost component in the upgrading processes, industry considers this area of research as a key to the future sustainable development of Alberta's oil sands and heavy oil resources. The goal of a number of ongoing projects is to gain a better understanding of the role of hydrogen in the hydroprocessing, hydrocracking or hydrogen addition processes currently being used by industry.

ENERGY AND THE ENVIRONMENT

The Department of Energy addresses environmental concerns resulting from the development, production and consumption of energy resources. The focus is on integration of resource development and environmental protection, and on development of initiatives to manage atmospheric emissions associated with energy production and use.

Integrated Resource Management — The Department subscribes to the philosophy of integrated resource management to ensure that resource-use decisions are made in the broader context of multiple land use. This presents the Department with the opportunity to review land and resource management policies, programs and objectives of participating government agencies. Such reviews ensure that programs are consistent with the government's overall plan for managing Alberta's mineral resources. The Department reciprocates by sharing information on energy or mineral resource management initiatives with these agencies.

Integrated resource management is supported by the Department through a number of methods, the most formal of which is participation in the province's Integrated Resource Planning Program.

In the 1994–95 fiscal year, the Operations and Support Division worked to maintain opportunities for the industry to gain access to and develop the mineral resources in each planning area. Progress was made on 10 Integrated Resource Plans (IRPs) and 3 major Integrated Resource Plan reviews. To date, 30 IRPs have been approved in the province.

The Operations and Support Division also participated in 4 Regional Integrated Decisions, which are similar to Integrated Resource Plans but have a local or resource issue focus. One Regional Integrated Decision was approved for implementation in 1994–95.

The Department referred 25 petroleum and natural gas land lists containing 12,122 land parcels, 9 oil sands land lists containing 55 land parcels, 58 metallic mineral land lists containing 421 land parcels, and 15 individual applications for mineral agreements to other government departments to review for possible environmental land use conflicts.

The Department also participates in integrated resource management through a number of interdepartmental referral processes. During the year, 57 referrals were received for review and comment. These referrals included 1 preliminary disclosure to government; 3 environmental impact assessments; 13 applications for surface dispositions for commercial tourism and recreation leases; 21 applications to designate land for uses such as future parks, ecological reserves or wilderness and natural areas; and 19 miscellaneous applications. Each referral was reviewed for its impact on access for existing or proposed mineral development activity.

Late in the 1994–95 fiscal year, the Department began co-chairing a task force with Alberta Environmental Protection to develop an improved framework for Integrated Resource Management in order to better support the province's sustainable development needs.

Caribou Conservation — The Operations and Support Division actively supported Alberta's caribou conservation efforts by participating on 5 regional caribou standing committees as well as on the Provincial Caribou Strategy Task Force. These committees include the Northeast Region Standing Committee on Woodland Caribou, comprising government and the energy, peat and forest industries. This committee has continued its program of research into caribou biology and population dynamics, as well as into effects of industrial operating conditions on the caribou range in northeastern Alberta. Interim guidelines were developed for operating in caribou areas in northeast Alberta and they worked well in the winter of 1994–95. The experience and research results gained over the year contributed to improved guidelines. The standing committee for the Northwest Region also initiated a field research program on caribou, and this region's operating guidelines were successfully implemented in the 1994–95 field season. During the year the Provincial Task Force, working from a broader perspective, finalized a draft provincial caribou conservation strategy.

National Action Program on Climate Change — The Department continued its active involvement in the National Air Issues Coordinating mechanism during the 1994–95 fiscal year. This group of representatives from federal, provincial and territorial departments of energy and the environment is responsible for the national coordination of atmospheric issues. The major issue for the mechanism during the fiscal year was the development of the National Action Program on Climate Change. Since the actions Canada takes in response to the climate change issue have potentially significant implications for the energy industry and the economy of Alberta, the Department, with assistance from Alberta Environmental Protection, has been taking an active role in the development of the National Action Program.

The Department was an active member of the national Climate Change Task Group that the coordinating mechanism formed to identify cost-effective greenhouse gas mitigation measures and assess the impact these measures would have on the economy. In addition to representatives from the federal and provincial governments, the Task Group included participants from industry and environmental organizations.

A small team of federal and provincial government officials agreed to draft an action program derived from work of the Climate Change Task Group. The Department participated on this drafting team, developing a flexible, realistic plan for working towards Canada's goal of stabilizing emissions of greenhouse gases at 1990 levels by the year 2000. A central element of the National Action Program on Climate Change is a Voluntary Challenge and Registry program (see below).

The federal, provincial and territorial ministers of energy and environment approved the National Action Program on Climate Change. It was subsequently tabled in Berlin at the Conference of the Parties to the Framework Convention on Climate Change.

Alberta Climate Change Action Plan — The Clean Air Strategic Alliance (CASA), which includes the Deputy Minister of Energy as a member, established a Climate Change Project Team to develop a provincial approach to the climate change issue and to support and advise the government on development of the National Action Program on Climate Change.

This provincial team, chaired by the Department, developed a set of principles and recommendations for an Alberta Climate Change Strategic Action Plan, including a recommendation to endorse the concept of a national voluntary challenge program. These principles and recommendations were approved by the Cabinet in October 1994 and formed the basis of the provincial position at the federal-provincial energy and environment ministers meeting in Bathurst in November 1994. The Climate Change Project Team has continued to develop Alberta's Climate Change Strategic Action Plan, focusing on cost-effective actions which could be adopted by industry, government and all Albertans.

Voluntary Challenge and Registry Project Team — A key element of Canada's National Action Program on Climate Change is the national Voluntary Challenge and Registry program. The Department (and many Alberta stakeholders) were early champions of a voluntary approach. As a result, the Department hosted two focus group sessions in Edmonton for initial development of the voluntary challenge concept. Results from these sessions were presented to the National Air Issues Coordinating mechanism which struck a Voluntary Challenge Steering Committee to ensure the program concept was developed to the point where it was ready for implementation. The Alberta Department of Energy co-chaired this committee along with Natural Resources Canada.

The objective of the Voluntary Challenge is to encourage Canadians and organizations to develop action plans for reducing their greenhouse gas emissions. These plans, along with reports on the actual emission reductions, will be recorded in a national Registry. The Registry will allow for voluntary actions to be recognized by government and will act as a clearinghouse of opportunities that other Canadians will be encouraged to consider.

Clean Air Strategic Alliance Projects — The Department continued its active support of the Clean Air Strategic Alliance (CASA) as the appropriate way of strategically managing issues of air quality in the province. In addition to assisting Alberta Environmental Protection with the core funding for CASA, the Deputy Minister of the Department of Energy was President of the CASA Board of Directors during the 1994—95 fiscal year. The Department actively participated on many CASA project teams, including the Climate Change Project Team previously described. These projects included:

- CASA D3 (*Flexibility in Electric Power Generation Options that Contribute to Clean Air*) — The Department chaired this multi-stakeholder task group of more than 50 members. The Team made 15 recommendations to the CASA Board. All were approved and several have already been implemented.
- CASA C4/C5 (*Energy Efficiency Opportunities*) — The Department chaired this task group to identify and develop promising energy efficiency opportunities that stakeholders could initiate in the province.
- SO_2 Project Team — The Department is participating on a project team that is reviewing the issue of sulphur dioxide emissions management in Alberta.
- Other Activities — Departmental representatives worked with project teams to develop energy efficiency codes for buildings and standards for appliances; improving energy efficiency of government buildings; environmental education; ambient air quality; and airshed monitoring in west-central Alberta.

Small Power Research and Development Program — The principal objective of the program is to encourage the generation of electricity from renewable sources to help determine the role of renewable power in meeting Alberta's future requirements.

Eighteen projects totalling 108 megawatts of program allocation are proceeding. These projects represent about 1.5 per cent of the total installed electric generating capacity in Alberta. The types of renewable resources being demonstrated under the program include wind, irrigation hydro, and biomass/waste.

The program closed on December 31, 1994, and no additional allocations are available.

State of the Environment Reporting — During 1994—95, the Department participated on the Alberta Government's State of the Environment Reporting Advisory Committee. With the departments of Environmental Protection; Agriculture, Food and Rural Development; and Health, the Department of Energy prepared a comprehensive State of the Environment Report. This report was tabled in the Legislature by the Minister of Environmental

Protection in 1995. Several areas of the report describe the impacts energy development and use have on the environment, and it outline actions that are being taken to reduce these impacts. In early 1995, the Advisory Committee began its work on a State of the Environment Report examining solid waste reduction in Alberta.

Energy Efficiency — In 1994, the Department successfully privatized the program functions of the Energy Efficiency Branch. The Energy Efficiency Association of Alberta now produces, markets, and distributes educational materials for teachers and students and conducts energy audits for commercial, industrial and institutional facilities. TransAlta Utilities Corporation operates the Energy Matters information line on a province-wide basis.

The Department continues to have a policy role in energy efficiency, as described above.

ENERGY'S LINKS WITH THE WORLD

Trade in energy is central to the strength of the province's economy. Alberta's energy industry operates in a global marketplace; its expertise and reliability are recognized in countries around the world.

Recognizing these facts, the Department of Energy has created an External Relations and Communications Division to bring a stronger focus to its dealings with other departments, governments and organizations. The division's responsibilities include coordinating the Department's external relations, actively promoting Alberta's interests in markets outside the province, managing foreign visits, and providing public communications services.

During the 1994–95 fiscal year, the division coordinated briefings and participated in arrangements for trade missions and delegations from China, Russia, Japan, France, Saudi Arabia, South Korea, Tunisia, Taiwan, Venezuela and other countries, and participated in the Alberta Government's mission to Houston, led by Premier Klein, to promote the Alberta Advantage. As well, the division provided assistance to other departments involved in trade missions around the world.

Because of its global energy outlook, the Department is a member of international organizations such as the World Petroleum Congress and both the Energy Council, based in the U.S., and the World Energy Council. The External Relations and Communications Division helps strengthen these important links with the world of energy beyond the province's borders.

Part of the Department's responsibilities in the international field is represented by the Memorandums of Understanding (MOUs) it has with 18 countries: Argentina, Azerbaijan, Brazil, China, Cuba, Ecuador, Hungary, Japan, Nigeria, Pakistan, Peru, Romania, Russia, South Korea, Trinidad, Turkey, United States, and Venezuela. The MOUs provide an umbrella under which agreements may be made with state agencies in foreign countries for technical assistance or the exchange of information.

In its communications role, the division's services include preparing news releases, newsletters, annual reports and other publications, responding to media enquiries and requests for information from the general public, producing audio-visual presentations, preparing displays, and providing editing, graphic design and print services.

DEPARTMENT OF ENERGY

STATEMENT OF REVENUES
FOR THE YEAR ENDING MARCH 31, 1995

	1994–1995 Budget ($000)	1994–1995 Actual ($000)	1993–1994 Actual ($000)
Taxes			
Freehold Mineral Rights Tax	**$ 66,000**	**$ 102,158**	**$ 83,824**
Non-Renewable Resource Revenue			
Crude Oil Royalty	649,000	1,096,759	766,485
Natural gas and byproducts royalty	1,566,000	1,241,707	1,410,413
Synthetic crude oil and bitumen royalty	38,000	222,825	66,446
Coal royalty	16,000	14,431	13,687
Bonuses and sales Crown leases	330,000	978,429	717,097
Rentals and fees:			
Petroleum and natural gas	98,000	104,792	93,786
Oil Sands	7,000	7,007	6,906
Coal	2,000	2,094	2,459
Other	3,000	879	1,383
Other		30	144
	$ 2,709,000	$ 3,668,953	$ 3,078,806
Less reduction to 5-year average	(190,000)		
	$ 2,519,000		
Transfers from Government Enterprises			
Alberta Petroleum Marketing Commission	$ 0	$ 3,165	$ 3,749
Other Revenue			
Refunds of expenditure		22	459
Miscellaneous		871	766
	$ 0	**$ 893**	**$ 1,225**
Total Revenue	**$ 2,585,000**	**$ 3,775,169**	**$ 3,167,604**

DEPARTMENT OF ENERGY

STATEMENT OF EXPENDITURES
FOR THE YEAR ENDING MARCH 31, 1995

	1994–1995 Budget ($000)	1994–1995 Actual ($000)	1993–1994 Actual ($000) (Restated)
Central Support Services	$ 1,214	$ 1,599	$ 1,354
Strategic Resources and Finance	22,713	26,010	23,153
Operations and Support	12,955	13,771	13,774
Energy Policy	7,273	5,088	6,974
Oil Sands and Energy Research	20,765	19,309	21,472
Alberta Petroleum Marketing Commission (1)	3,334	2,410	3,334
	$ 68,254	**$ 68,187**	**$ 70,061**

Statement of Expenditure:

Note 1
Effective April 1, 1994, costs not associated with the marketing of crude oil were included in the Department budget.

Note 2
Grants for the operation of the Alberta Energy Utilities Board are not included in the Statement of Expenditures.

Note 3
The 1994 figures have been restated where necessary to confirm to the 1995 presentation.

PERFORMANCE MEASURES

The purpose of these measures is to improve performance and to provide full accountability to Albertans. Simplicity, clarity and candour are considered the essence of good accountability and are the standards set for the measures.

The oil and gas industry in Alberta is a primary driver of the economy. In 1994, Alberta's economic growth totalled 4.2 per cent, which is largely due to the performance of the oil and gas industry. This growth translates into jobs and economic prosperity for Albertans.

The measures presented are primarily indicators of the performance by the oil and gas sector. They are used by the Energy Ministry to evaluate policy alternatives and to identify changes or actions that need to be taken.

Industry performance is influenced by a number of factors, including pipeline capacity, business strategies, geology of the Western Canada Sedimentary Basin, interest rates, general economic activity and commodity prices. Oil and gas prices are driven by changes in supply, demand, geopolitics and weather patterns. Price changes dramatically affect the profitability of the industry, the economics of investment and the ability to generate the funds necessary for that investment. This in turn impacts land sales, exploration activity, drilling levels and equipment expenditures.

The changes to the royalty regime introduced in October of 1992 addressed this issue by making royalties more price sensitive. But as royalties represent about 14 per cent of upstream industry revenues, the cyclical nature of the industry will continue to be felt throughout the Alberta economy.

OIL AND GAS DISCOVERIES VERSUS PRODUCTION

Description:

The measure gives the established oil and gas reserves at the end of each year and the five-year average of new discoveries and revisions as a percentage of production.

Results:

	1991	1992 (Base)	1993 (Actual)	1994 (Actual)	1994 (Target)	1995 (Target)
Established Conventional Oil Reserves (billions of barrels)	2.94	2.78	2.68	2.37	2.56	2.28
Proportion of Production replaced (five-year average)	38.9%	36.5%	37.6%	31.1%	55.4%	45.3%
Established Gas Reserves (trillions of cubic feet)	57.7	56.6	54.5	52.9	52.1	51.5
Proportion of Production replaced (five-year average)	77.2%	87.3%	80.5%	68.9%	70.7%	63.8%

Source: AEUB

Explanation:

The oil and gas industry depends on adequate reserves of oil and gas, and the ability to replace production with exploration and development. Because Alberta is a mature basin and fossil fuels are a non-renewable resource, Alberta's reserves of oil and gas are expected to decline slowly. The Energy Ministry's fiscal regime is designed to promote a sustainable level of activity that allows for the orderly and economic development of the resource.

Performance:

In 1994, new discoveries by industry accounted for only 8.26 per cent of the conventional oil produced. Though oil drilling was close to the forecasted level, revisions to the recovery factors for some large oil pools in Alberta resulted in a large decline in oil reserves. Total additions to the established reserves were less than forecast. The 1995 target reflects a year without a decline.

For natural gas, the industry found new reserves that accounted for 62.5 per cent of 1994's record production. Due to the deregulation of natural gas markets which started in 1985, industry is rationalizing its reserve base and so the ratio has fallen as the industry has focused on deliverability and production.

OIL AND GAS PRODUCTION

Description:

Gas and oil production in Alberta.

Results:

	1992/93 (Base)	1993/94 (Actual)	1994/95 (Actual)	1994/95 (Target)	1995/96 (Target)
Gas Production (trillion cubic feet)	3.848	4.014	4.449	4.340	4.642
Non-conventional Oil Production (millions of barrels)	130.000	141.000	147.000	152.000	158.000
Conventional Oil Production (millions of barrels)	337.000	347.000	350.000	344.000	351.000

Source: AEUB/Alberta Department of Energy

Explanation:

Growth in gas production and exports has increased Alberta's profile and role in the North American gas market. Growth in oil production indicates the importance of the non-conventional oil resources, and the ability of the industry to sustain high levels of conventional oil production in a mature basin. Continued growth in exports of both oil and gas depends on pipeline expansion.

Performance:

Conventional oil and gas production exceeded the forecasts due to higher drilling levels and technological improvements such as horizontal drilling.

EMPLOYMENT IN THE OIL AND GAS INDUSTRY

Description:

Number of people employed in the upstream oil and gas industry in Alberta.

Results:

	1991	1992 (Base)	1993 (Actual)	1994 (Actual)	1994 (Target)	1995 (Target)
Upstream Production Industry	41,900	42,400	37,400	38,500	38,500	38,500
Service Industry	19,100	18,000	23,500	24,400	24,400	24,200
Production Per Upstream Employee (barrels of oil equivalent)	20,191	22,611	27,684	27,471	27,552	28,433

Source: Statistics Canada Labour Force Survey

Explanation:

Since the oil and gas industry is a major employer in the Alberta economy, direct employment in the industry is a significant indicator of the financial health of the industry and the province's economy. The Energy Ministry helps to maintain high employment levels by fostering orderly, sustainable development of Alberta's resources. Through its fiscal regime and the promotion of market principles in regulation, the Energy Ministry enables the industry to efficiently produce and market Alberta's oil and gas resources.

Performance:

The number of people employed in the industry increased by approximately 2,000 in 1994 as a result of the increased exploration and development activity. It is expected that employment will drop slightly in 1995 owing to reduced activity resulting from lower natural gas prices.

OIL AND GAS INDUSTRY DRILLING ACTIVITY

Description:

Licensing and Drilling Activity under Alberta's Oil and Gas Regulations.

	1991	1992 (Base)	1993 (Actual)	1994 (Actual)	1994 (Target)	1995 (Target)
Total Wells Licensed	4043	4200	8233	10,884	10,800	8,500
Drilling Success Rate	69%	71%	78%	76%	75%	76%
Exploratory Success Rate	48%	52%	57%	63%	55%	55%
Total Wells Capable of Production	75,000	77,000	81,000	85,736	86,000	90,000

Source: AEUB

Explanation:

Exploration for oil and gas is an essential step in maintaining adequate reserves and replacing amounts used in production. The primary indicator of this activity is the licensing and drilling of wells. Data and information systems provided by the Alberta Energy and Utilities Board, help industry achieve a high success rate.

Performance:

Alberta established a record year in 1994 in terms of wells drilled and wells licensed. The forecast for 1995 is that drilling activity will drop as a result of lower natural gas prices and reduced industry cash flow.

OIL AND GAS INDUSTRY CAPITAL SPENDING

Description:

Capital spending in Alberta by the upstream oil and gas industry.

Results:

	1991	1992 (Base)	1993 (Actual)	1994 (Actual)	1994 (Target)	1995 (Target)
Total Capital Spending ($ billions)	$5.7	$4.9	$6.5	$9.8	$7.7	$7.2

Source: Petroleum Monitoring Agency

Explanation:

The level of capital spending for exploration, development and production of oil and gas is a measure of both the health of the industry and the desirability of investing in Alberta. The record levels of spending expected for 1994 and 1995 reflect increases in prices, demand and market access, and demonstrate the importance of providing an attractive fiscal regime as part of the Alberta Advantage.

Performance:

The record drilling activity in 1994 was the result of record high capital spending levels by the oil and gas industry. This was also reflected in the dramatic increase in Crown land sales. It is expected that capital spending by the industry will drop in 1995 as the result of lower revenues and cash flow resulting from lower natural gas prices.

SALE OF PETROLEUM AGREEMENTS

Description:

Sale of hectares under Alberta's oil and gas tenure legislation.

Results:

	1992/93 (Base)	1993/94 (Actual)	1994/95 (Actual)	1994/95 (Target)	1995/96 (Target)
Total Hectares Sold for Petroleum and Natural Gas Agreements (millions)	1.562	3.867	4.98	4.500	3.100

Source: Department of Energy

Explanation:

The sale of agreements for petroleum and natural gas rights demonstrates the vitality of exploration efforts in the oil and gas industry. The purchase of these agreements for development or recovery of minerals at the start of the exploration cycle is a lead indicator of the desirability of exploring for oil and gas in Alberta and the level of future seismic and drilling activity in the province. The targets represent a turnover of approximately 6.8 per cent per year among the 50 million hectares available from the Crown.

Performance:

Sales of petroleum and natural gas agreements exceeded the target as industry spent nearly one billion dollars. The reduced capital spending in 1995 is expected to result in a more average year for the sale of petroleum and natural gas agreements.

ENERGY EXPORTS

Description:

The value of energy exports from Alberta.

Results:

	1991	1992 (Base)	1993 (Actual)	1994 (Actual)	1994 (Target)	1995 (Target)
Value of Energy Exports ($ billions)	$9.6	$10.8	$12.3	$13.7	$14.3	$12.6

Source: Economic Development & Tourism

Explanation:

Alberta's energy exports are important to the economy of Alberta and Canada. The ability to generate trade and foreign currency is vital in today's global economy. The value of Alberta's energy exports measures the magnitude of the trade in energy resources.

Performance:

Due to natural gas prices that were lower than forecast, the value of exports did not reach the targeted levels. The drop in 1995 exports is the result of the expected further drop in natural gas prices.

PUBLIC SAFETY

Description:

Improvement in compliance level of problem operators.

Results:

	1991	1992 (Base)	1993 (Actual)	1994 (Target)	1995 (Target)
Compliance Level Improvements of Problem Operators	N/A	N/A	N/A	N/A	10% Improvement

Source: AEUB

Explanation:

The Alberta Energy and Utilities Board ensures that development of Alberta's energy resources takes place in a responsible manner. As part of this mandate, it works through the regulatory process to ensure that the industry protects public safety. A strong indicator of the success of this activity is the improvement in the compliance level of problem operators.

Performance:

Monitoring of a group of operators with previously identified problems in this area began in 1994. Data will be available by the end of 1995.

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